
Thanks, Prof. Rayward, for Explaining. . . .

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ABSTRACT

Information history is moving beyond listing the “what” and to answering how-and-why systems emerged, prospered, or died. This paper explores the nature of (and debates over) explanation in historical studies. The conclusion is that the history of information has to rely upon complex explanations that are a mixture of social science and humanities approaches. There are no formulas for such historical work, as shown by Boyd Rayward’s sensitive efforts on the history of Paul Otlet’s career and personal life.

Boyd Rayward’s work has inspired many of us who explore the history of information to go beyond listing the “what happened” and attempt to explain—to identify the “how and why” of a system’s or institution’s emergence, successes and failures, impact, and, perhaps, lingering decline.¹

However, explaining is a difficult and complex challenge. It is more demanding of logic and evidence than listing the “what” in history; evaluating the internal merits of a technical contribution; or, pejoratively declaring the influence of such things as chauvinism or sexism.² Explaining also depends on more rigorous research than does, for example, categorizing an individual or enterprise as being covered by a historical construct such as The Age of Information (Castells, 1996, 1997, 1998) or The Control Era (Beniger, 1986).

Explaining in historical work is more challenging than in the physical or biological sciences (or clinical/experimental social sciences) because history was never a closed system in which a few “controlled” variables could determine an outcome. Causation in institutional and human lives is rarely simple or tidy, and causal factors may interact in unexpected and complicated ways.

Identifying “causes” in history is demanding. Even statistical techniques used to establish post facto controls have their limits in historical research. A historian might use sophisticated statistical tests to estimate, for example, the relationship between the distribution of the number of Catholic churches across geographic units and Democratic voting in the United States since the 1920s. Such studies are vital preludes to explanation. However, the resulting estimates will not usually be a full explanation of any individual’s political choice—although they might add the weight of probability to a specification of the reasons for a voter’s decision.³

In addition, explanation requires much more than giving recognition to broad historical economic contexts. General social/demographic or economic trends may contribute to historical outcomes, but they are unlikely to be sufficient, anywhere near complete, explanations. Sufficient explaining, furthermore, cannot rely only on social or psychological theories. Existing theories are too limited in their reach, and lawlike social and historical theories may well restrict an investigator’s research to only the factors they emphasize.⁴

Inescapably, historians have had to call upon humanities-based concepts, such as motives and choices, to explain outcomes. As well as requiring sensitive weighing of the role of sociological, economic, and market factors, explaining usually requires evidence-based exploration of the details of the lives and decisions of those who built and managed technologies and systems.

There are other complications in explaining. Causation in history is rarely instantaneous. A significant outcome may be the result of a choice or action decades before. For example, a financially well-situated computer company might decide to reduce its investment in long-term research and then find years later that it missed a critical shift in technology.⁵ Or, an aspiring young mathematician may have been attracted to a college’s small computer-based program to find that he was in an advantageous position when his instructor’s professional and personal connections linked him to a rise in funding for a new field such as automatic information retrieval.⁶

Because of all this, a valid historical explanation may appear disorderly and “chatty,” seemingly unscientific. But such complexity does not indicate poor methodology. In fact, the acceptance of any attractive and sweeping historical generalizations that posit causation has to be based on the accumulation and analysis of well-grounded yet “messy” historical explanations of particular happenings. Any post facto “controls” needed to estimate the role of grand general causes are achieved through structured comparisons of findings based on research that has been open to identifying all possible influences.

There has been a reawakening of the need for “cluttered” explanatory history and for focusing on the particular before generalizing. For exam-

ple, the failure of all-encompassing deterministic historical explanations, such as Marxism, and new explorations of the history of technology by researchers such as Thomas Parke Hughes, have demonstrated that detailed and localized historical research is a necessity and that the technical merits of systems have rarely been sufficient to account for their careers.⁷

Leaders in 1950–60s social science and demographic analytic history, such as Lawrence Stone of Princeton University, also found that particularistic and proximate, even biographical, narrative history was irreplaceable (Stone, 1979; Haskell [1998] also discusses this issue). The narrative form is like a story. It has a beginning and ending, a thematic integration, and its biographical structure includes an interwoven mix of causal types ranging from truisms to social or economic laws.

Using the narrative form does indicate a belief in subjectivity or historical simplicity. Even Relativists and Postmodernist historical philosophers, from the 1930s to the 1990s, who proclaimed there was “no truth” in historical research, frequently rejected their own precepts. They turned to a belief in “facts” and detailed (with epistemic confidence) the history of such things as the Enlightenment, scientific research, women’s history, and European prison systems.⁸ Scholars of the 1980s and 1990s who favored the relativistic “linguistic” approach in anthropology also became aware of the complexity of cultures and personalities. They became sensitive to the incompleteness of theory-dictated (and thus restricted) descriptions and explanations while they accepted the possibility of “true” history.⁹

Information history should be informed by the return to complex, time-sequence, and causally interactive explanations. It has already been shown that in some critical instances, information work has been a deeply human activity that was shaped by unpredictable combinations of disorderly influences including reasons, values, health, family obligations, and ambitions. Of course, multiple contextual factors, ranging from law and politics to transportation costs, also played significant roles.

Furthermore, it appears that such complex histories were best organized through a personalized (biographical) narrative, not analytic, approach. Wayne A. Wiegand’s book (1996) on Melvil Dewey, Stephen J. Bensman’s work (2007) on Eugene Garfield, and Michael Buckland’s volume (2006) on Emanuel Goldberg stand as examples of the need for rather personalized “information” histories. Historians of information technology companies, ranging from IBM, CDC, and Xerox, to Microsoft and Apple, have also had to call on the “fickle,” personal, and nonreducible in history to complete their stories. Good examples are Carroll (1993); Ellis (2006); Isaacson (2011); Manes & Andrews (1993); Malone (1999); and Worthy (1987).

Boyd Rayward has made information historians aware of those and other trends in historiography. He linked information history to broader historical work, such as that of France’s famed *Annales* school of social

history, and to the newest historical sociology represented by Anthony Giddens (1987). But it is his efforts on a particular segment of information history that is, so far, his greatest contribution.¹⁰

Especially important guides for future explaining, and for managing the details of information history, are Rayward's efforts on the birth, life, and erratic career of Paul Otlet and Henri La Fontaine's grand international "House of Documentation." This seemingly inexplicable 1895 attempt to build a central repository for all the world's knowledge, and to do so in the tiny country of Belgium while the powerful British Empire was planning its own great information venture, has been the target of Rayward's untiring efforts for decades.¹¹

Rayward has done much more than detail the technical "what" of the gigantic file-card repository in Brussels and of the Universal Decimal Classification system devised for retrieving information from it and, hopefully, the entire world's publications. His tireless archival labors have helped us understand that personal characteristics, family connections and finances, social and national goals, nationalistic conflicts, ideology, and politics (not just technological-financial-market opportunities and limitations) led to the triumphs and tragedies of the Repertoire Bibliographique Universel, the Universal Decimal Classification, and Otlet and La Fontaine's many ambitious world peace initiatives.

The search for answers to another set of information history's "how and why" challenges has, like Rayward's explorations, revealed an indisputable need for evidence-based, "chatty" explanations. The mysteries are the origins and fate of the ambitions of one of Otlet and Fontaine's allies, the American Herbert Haviland Field. His broad science-information goals centered on his 1890's Concilium Bibliographicum of Zurich, Switzerland. It was soon providing a biweekly card-based and sophisticatedly classified bibliography of all the world's zoological publications. He hoped his service would eventually cover a wide range of science and technology topics. At the high points of its tumultuous near fifty-year history, the Concilium was sending millions of cards a year to its subscribers in Europe, America, and even the Pacific region—and it was fulfilling its pledge to survey all the publications in its fields of interest. (See Burke, *in press*.)

The histories of the Concilium and, necessarily, Herbert Field and his family, are complex. The Concilium's emergence and its fate are not sufficiently explained by general influences such as the rise of professionalized science, the new technology of index cards, or the rising need for summaries of the burgeoning science literature.¹² The lives of Herbert, the Concilium, and his family also do not yield to a narrow definition of the subjects of study, or to monocausal explanations.

Answering the many intertwined "how and why" questions in the Concilium's past demanded an examination of more than the technical/

economic aspects of Concilium's products. The Field family's international connections, Herbert's religion, his multilingual abilities, his contacts with the most powerful men and institutions in America's Eastern liberal intellectual and political elites, his ties to Europe's intellectual set, and his family's and his own financial highs and lows played important roles in the Concilium's story.

Anything approaching an explanation of Herbert's information project's life also has to include national competitions over the control of bibliographic services, the impact of World War I and the Russian Revolution, Herbert's role as an intelligence agent, and the emergence of new types of science practice—ones that saw little need for the Concilium's intellectually elegant classification scheme based on the Universal Decimal Classification. Even the health of the Fields and Herbert's speech problems played significant parts. The histories of other related science information systems, ranging from professional journals to the abstracting services of the first half of the twentieth century, and the rather mystifying history of Herbert's family after his untimely death just after World War I, also called for deep explorations and complex explanations that included influences such as the weakness of the League of Nations, the rise of international Communism, and the impact of Progressive education and new philanthropies.

There are uncounted numbers of other information adventures and systems that need deep explanations. Among the many, many tantalizing puzzles that should tweak the interest of historians are the attempt by two ex-chemists at America's small nonprofit Western Reserve University in the 1950s to create a huge profit-making sci-tech information center;¹³ the conflict-torn crusade by the United States' ex-Vice-President Henry Wallace, and his left-leaning political allies, to establish a vast government-run information system for small businessmen;¹⁴ the important role of a once rather placid college, Stanford University, in automated information retrieval;¹⁵ the travails of the League Nations and the United Nations' (UNISIT) information efforts;¹⁶ the wanderings of the Council on Library Resources on its quest for consistent policy;¹⁷ and, the prestigious University of Chicago library school's loss of a position of leadership in the processing of "information" by the 1950s.¹⁸ From the work that has already been done on these puzzles, it seems they will deserve complex, perhaps "chatty" narratives.

NOTES

1. On trends in the work on information history, see Burke (2007).
2. An irreplaceable discussion of types of valid explanation in the various "hard" sciences, and in the social sciences and history, is Nagel (1979). He makes it clear that hard science's most revered causal explanation patterns, such as those based on necessary or sufficient conditions, are admirable but difficult to fulfill in historical studies because of the lack of experimental control. However, Nagel believes in the possibility of valid evidentially

based explanations in historical work—although they may not fit the experimentally based determinate law models. The debates over explanation in general, and in history, continue. On explanation in general, works that contain up-to-date arguments and bibliographies are Cornwell (2004) and Strevens (2008). A useful new work for explanation in history is Gaddis (2002).

3. The study of voting was one of the first targets of the new post-WWII quantitative social science research in the United States. Advanced statistical methods allowed the production of many sophisticated studies of contemporary and historical voting patterns. Those studies served as evidential foundations for explanations and were used to test standing explanatory hypotheses. However, satisfactory explanation demanded more than statistics. Take, for example, the concluding chapters in the classic work by Benson (1970).
4. On the great hopes for all-encompassing mid-level, not grand, law-based social science and historical theories, such as role theory or reference-group theory, see Berelson (1963); Campbell (1960); Benson (1972); and Kammen (1980). Some of that faith in using “scientific” methodology in history “trickled-down” to a more practical level, as shown in Fischer (1970). In the years after World War II, there also was a faith that “information” would soon have its own mathematical and perhaps axiomatic theories based on a few powerful “laws.” The most famous example of that is Shannon and Weaver (1949).
5. One of the more recent examples is the case of the Hewlett-Packard Corporation: Neate (2012).
6. See Akera (2006) and Cohen (1999) for insights into the influence of personalities and connections to important figures, such as Warren Weaver, on the careers of two information science pioneers, Anthony Qettinger and Gerard Salton.
7. A readable source that provides an introduction to the rejection of the deterministic grand historical explanations, and the tangled history of responses, is Novick (1988). An insight into the relatively early turn away from grand theory in sociology is Merton, R. K. (1968). The rejoinders to claims that historical work cannot be objective and that there is no “nature,” just socially constructed views, is discussed below. Examples of the acceptable restrained version of “social construction” of technological systems are found in Bijker (1987) and Bowker & Starr (1999).
8. See the work of some famous relativists: Becker (1931); Foucault (1995); and Latour (1986) and (1999). Kuhn (1996) and Conant & Haugeland (2000) also show that one of the most famous supposed “relativists,” Thomas S. Kuhn, did not abandon a belief in the possibility of truth in historical work.

There are now many telling criticisms of the subjectivity theses as found in the more extreme versions of Postmodernism. For example: Gross & Levitt (1994); Gross, Levitt, & Lewis (1994); Kortege (1998); and Martin (2009).

9. Helpful on anthropology and cultural studies is Erickson & Murphy (2003). Iggers (1997) and Wilder (2012) discuss recent trends in historical research methods and premises.
10. Some of his more recent social-science related works are Rayward (1996); Rayward (2008).
11. Prof. Rayward has written many articles on Otlet and plans a full biography, but his epic remains: Rayward (1975).
12. Interesting work on the increase in the amount of scientific literature and accompanying problems is found in Csiszar (2010).
13. Introductions to the question are Bowles (1998) and Cramer (1976).
14. First steps toward answers are in Culver and Hyde (2000) and Stewart (1993).
15. Lowen (1997) and Bourne & Hahn (2003) provide starting points.
16. Useful entries into the complex histories are Bennett (1950); Nordstrom (1986); Pycior (1978); Williams (1988); and International Institute of Intellectual Cooperation (1933).
17. Marcum (2002) provides many insights and a valuable bibliography.
18. Paths toward answers are in Richardson (1982) and Vann (1971).

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